

List of figures

Figure	Title	Page
(1)	Schematic representation of two views on the development of the primary and secondary vitreous during embryological development in the tenth week or 50-mm stage.	5
(2)	Schematic diagram of classical vitreous anatomy	10
(3)	Orientation of collagen fibrils in the posterior vitreous cortex in an old man	11
(4)	Anterior loop of the vitreous base. Central, anterior, and peripheral vitreous structure in a 76-year-old man.	12
(5)	Ultrastructure of human vitreous fibers. Although centrifuged to concentrate structural elements, these specimens of adult human vitreous contained no membranes or membranous elements.	13
(6)	Vitreous humor structure showing the increase in concentration of hyaluronic acid from the anterior to the posterior of the eye.	14
(7)	The orientation of heterotypic fibrils in the vitreous gel and anatomy of the vitreous and surrounding structures.	15
(8)	Ultrastructure of human posterior vitreous cortex.	17
(9)	Transmission electron microscopy identifies this tissue as the internal limiting lamina (ILL) of the retina attached to the posterior vitreous cortex.	17
(10)	Dark field microscopy of the posterior vitreous.	17
(11)	Dark-field slit microscopy of central and posterior vitreous.	18
(12)	Dark-field slit microscopy of peripheral vitreous.	19
(13)	Human hyalocytes in the posterior vitreous cortex.	22
(14)	Human hyalocytes in situ. Phase-contrast microscopy of flat-mount preparation of posterior vitreous cortex from the eye of an 11-year-old girl obtained at autopsy.	22

List of figures

Figure	Title	Page
(15)	Ultrastructure of human hyalocyte.	23
(16)	The morphological characteristics and the distribution of hyalocytes. TEM micrograph of a hyalocyte was distributed in the vitreous cavity close to the retina.	24
(17)	Schematic diagram of vitreous collagen fibril structure.	25
(18)	Schematic digram of hyaluronan (HA) molecule.	29
(19)	Ultrastructure of hyaluronan/collagen interaction in bovine vitreous.	32
(20)	Immunohistochemical analyses of types II, VI and VII collagen (red-brown staining) at the equator evaluated by LM (paraffin embedding).	35
(21)	Light microscopic image of a 77-year-old donor eye embedded in Technovit 8100: overview of the vitreoretinal border containing perpendicular vitreous lamellae.	36
(22)	Ultrastructure of the human internal limiting lamina (ILL) of the retina.	39
(23)	Age-related increase in the volume of the flow area in the human vitreous demonstrated in isolated vitreous bodies by a dye-injection technique.	41
(24)	Posterior vitreous. Frontal section through a ruthenium red/glutaraldehyde-fixed adult human eye.	42
(25)	Anterior and peripheral vitreous in a 57-year-old man.	44
(26)	Human vitreous structure in old age.	45
(27)	Liquefaction of human vitreous.	46
(28)	Age-related degeneration of the human vitreous body.	48
(29)	Electron micrograph of a resin embedded section of human vitreous (age 76).	51

List of figures

Figure	Title	Page
(30)	A model for ageing changes in the vitreous.	52
(31)	Anomalous PVD. This schematic diagram demonstrates the various possible manifestations of anomalous PVD.	54
(32)	Vitreo-retinal interface. Immunohistochemical studies of the monkey vitreo-retinal interface.	55
(33)	Clinical vitreoschisis. Combined OCT/SLO imaging detected a split in the posterior vitreous cortex.	56
(34)	Ultrasonography of vitreoschisis in the human.	57
(35)	Indirect immunofluorescence micrographs illustrating frozen sections of bovine vitreous residues. Fluorescent micrographs of the posterior retina.	62
(36)	Electron micrographs of immunogold-labeled sections of vitreous residues. Fluorescent micrographs of the posterior retina.	63
(37)	Micrograph of immunofluorescent staining with antisera to fibronectin (FN) in the vitreous of a 29-year-old male.	63
(38)	Fluorescent micrographs of the peripheral region of the human retina stained with antisera to fibronectin (FN) and to laminin (LM) and phase contrast micrographs (PH) of the same field. a, 29-year-old male.	64
(39)	Fluorescent micrograph of the equatorial retina stained with antisera to laminin (LM) in the eye of a 70-year-old female, or to fibronectin (FN) in the eye of a 72-year-old female.	65
(40)	Fluorescent micrographs of the posterior region of the human retina stained with antisera to fibronectin (FN) or to laminin (LM)18-year-old female.	66
(41)	Fluorescent micrographs of the optic nerve stained with antisera to fibronectin or to laminin in the eye of a 74-year-old male.	68

List of figures

Figure	Title	Page
(42)	Fluorescent microgrphs of the posterior retina stained with antisera to fibronectin (FN) in the eyes of a 63-year-old diabetic male (left) and a 56-year-old non-diabetic male (right).	69
(43)	Fluorescent micrographs of the posterior retina stained with antisera to laminin (LM).	70
(44)	Fluorescent micrographs of the optic disc stained with antisera to fibronectin (FN) and to laminin (LM) in the eye of an of an 86-year-old diabetic male.	71
(45)	Fluorescent micrographs of the equatorial retina with subretinal proliferation stained with antisera to fibronectin (FN) or to laminin (LM) in the eye of an 86-year-old diabetic male.	71
(46)	Fluorescent micrograph of the peripheral retina and the vitreous base stained with antilaminin (LM) and a phase contrast micrograph of the same field (ph) in the eye of an 86-year-old diabetic male.	72
(47)	Fluorescent micrograph of the vitreous cortex stained with antifibronectin (FN) in the eye of a 62-year-old diabetic male.	72
(48)	Fluorescent micrograph of the posterior retina with preretinal and subretinal proliferation stained with antifibronectin (FN) and a phase contrast micrograph of the same field (ph) in the eye of a 69-year-old diabetic female.	73
(49)	Fluorescent micrograph of the posterior retina with preretinal proliferation stained with antifibronectin (FN) and a phase contrast micrograph of the same field (ph) in the eye of a 69-year-old diabetic female.	73
(50)	Fluorescent micrographs of subretinal proliferation stained with antisera to fibronectin (FN) or to laminin (LM) in the eye of a 63-year-old diabetic male.	74
(51)	Concept to induce posterior vitreous detachment using TPA.	106
(52)	Transmission electron micrograph of an enzyme-treated eye with tPA.	108

List of figures

Figure	Title	Page
(53)	Scanning electron micrographs of the vitreoretinal interface in feline eyes.	115
(54)	Light microscopy of semithin sections of feline eyes showed normal cytoarchitecture of the retina in microplasmin-treated eyes.	116
(55)	Confocal laser scanning microscopy with probes to GFAP (<i>green</i>) and vimentin (<i>red</i>).	117
(56)	Vitreous diffusion coefficients in intact pig eyes increase with increasing doses of microplasmin.	118
(57)	Scanning electron micrographs of the vitreoretinal interface in human donor eyes after injection with microplasmin.	120
(58)	Transmission electron micrographs of the ILM in human donor eyes.	121
(59)	Relationship between incubation time and the effect of 0.9 AU plasmin injected into rabbit eyes on the vitreous removal through the 25-gauge vitrectomy system.	131
(60)	Electroretinograms of a control eye (PBS injection) and of a plasmin-treated eye.	137
(61)	Light micrograph of a control eye 2 months after a PBS injection and light micrograph of a plasmin-treated eye 2 months post injection.	138
(62)	Transmission electron micrograph of a control eye 2 months after a PBS injection and plasmin treated eye.	138
(63)	Scanning electron micrographs of the posterior pole of plasmin treated eyes showing remnants of cortical vitreous.	139
(64)	Scanning electron micrographs of the equator of plasmin treated eyes showing remnants of cortical vitreous.	140
(65)	All controls had an attached cortical vitreous at the posterior pole, at the equator, and at the vitreous base.	141
(66)	The retina was not affected by plasmin treatment.	142

List of figures

Figure	Title	Page
(67)	In eyes which had undergone conventional vitrectomy, there were networks of collagen fibrils covering most parts of of the ILM.	143
(68)	In plasmin-treated eyes, vitrectomy created a smooth retinal surface consistent with a bare ILM.	143
(69)	Scanning electron microscopy (SEM) image of the retinal surface 30 minutes after an intravitreal injection of physiologic saline (<i>top left</i>) or 0.01 (<i>top right</i>), 0.1 (<i>bottom left</i>), or 1 (<i>bottom right</i>) FU nattokinase.	149
(70)	Light micrograph of rabbit retinas 30 minutes after an intravitreal injection of saline solution (<i>top left</i>) or 0.01 (<i>top right</i>), 0.1 (<i>bottom left</i>), or 1 (<i>bottom right</i>) FU nattokinase.	150
(71)	ERG a- and b-waves before and after nattokinase injection.	151
(72)	Light micrograph of rabbit retinas 1 week after an intravitreal injection of saline solution (<i>top</i>) or 0.1 (<i>middle</i>) or 1 FU nattokinase (<i>bottom</i>). Histology 1 week	152
(73)	The retinal architecture of the porcine eye was not affected by Dispase treatment at either 0.1 U/mL for 120 minutes or 5 U/mL for 15 minutes on histologic examination.	156
(74)	Transmission electron microscopy of the vitreoretinal junction in a control pig eye and in dispase-treated porcine eye.	157
(75)	Freeze-fracture scanning electron microscopy of the normal vitreoretinal junction in a control pig eye and after treatment with dispase.	158